WHAT IS CLAIMED IS:

1   1. A method for generating traffic information for analysis, the method

2   comprising:

3   a) accepting at least one sample derived from addressed data;

4   b) determining path-centric information based on the accepted at least

5   one sample; and

6   c) adjusting a traffic metric of a traffic parameter based on the determined

7   path-centric information.

1   2. The method of claim 1 wherein the addressed data is a packet.

1   3. The method of claim 1 wherein the sample includes information from the

2   header of a packet.

1   4. The method of claim 1 wherein the act of determining path-centric information

2   based on the accepted at least one sample includes using at least a part of the at

3   least one sample as a search key to find an item with a closest matching key in a

4   data structure.

1   5. The method of claim 4 wherein the data structure is a searchable data

2   structure selected from a group consisting of (A) a hash table, (B) a binary

3   search tree, and (C) a trie.

1   6. The method of claim 1 wherein the act of determining path-centric information

2   based on the accepted at least one sample includes:

3   i) using at least a part of the at least one sample as a search key to

4   find a first item with a closest matching key in a first data structure;

5   and

6   ii) using at least a part of the first item found as a search key to find

7   a second item with a matching key in a second data structure.

1   7. The method of claim 6 wherein the second item includes path-centric

2   information.

1   8. The method of claim 6 wherein the second item includes an origin

2   autonomous system and a peer autonomous system.

1   9. The method of claim 6 wherein the second item includes an autonomous

2   system path.

1   10. The method of claim 6 wherein the first and second data structures are tries.

1   11. The method of claim 6 wherein the first data structure is a Radix trie.

1   12. The method of claim 6 wherein the at least a part of the at least one sample

2   used as a search key is an internet protocol prefix.

1   13. The method of claim 6 wherein the at least a part of the at least one sample

2   used as a search key is at least one of (A) a source address and (B) a

3   destination address.

1   14. The method of claim 6 wherein the at least a part of the first item found used

2   as a search key is an autonomous system index.

1   15. The method of claim 1 wherein the sample includes at least two parameters

2   selected from a group parameters consisting of (A) a source address, (B) a

3   destination address, (C) a protocol, (D) a source port, (E) a destination port, (F)

4   an interface number, (G) a type of service, (H) an SNMP index, (I) a kernel

5   logical interface index, and (J) a type of interface indice.

1   16. The method of claim 1 wherein the path-centric information determined
2   includes an origin autonomous system and a peer autonomous system.

1   17. The method of claim 1 wherein the path-centric information determined
2   includes an autonomous system path.

1   18. The method of claim 1 wherein the act of adjusting a traffic metric of a traffic
2   parameter based on the determined path-centric information includes:
3   i) using a part of the determined path-centric information as a key
4   to search items of traffic parameters;
5   ii) if a traffic parameter with a matching key is found, incrementing
6   its traffic metric;
7   iii) if none of the traffic parameters has a matching key, creating a
8   new item.

1   19. The method of claim 1 wherein the traffic metric adjusted is at least one of
2   (A) a byte count and (B) a packet count.

1   20. The method of claim 1 wherein the traffic parameter is selected from a group
2   of traffic parameters consisting of (A) a particular pair of source and destination
3   addresses, (B) a particular pair of source and destination ports, and (C) a
4   particular pair of autonomous systems.

1   21. A method for generating data structures for mapping information in a sample
2   derived from addressed data, to path-centric information, the method comprising:
3   a) using network information, building a first data structure including items
4   of a first type, each of the items of the first type including an autonomous
5   system index and an internet protocol prefix, wherein the internet protocol
6   prefix is a key; and
7   b) using network information, building a second data structure including
8   items of a second type, each of the items of the second type including an

9   autonomous system index and an autonomous system path, wherein the

10   autonomous system index is a key.

1   22. The method of claim 21 wherein the first and second data structures are

2   tries.

1   23. The method of claim 21 wherein the first data structure is a Radix trie.

1   24. The method of claim 21 wherein the network information was derived from

2   routing information.

1   25. An apparatus for generating traffic information for analysis, the apparatus

2   comprising:

3   a) an input for accepting at least one sample derived from addressed

4   data;

5   b) means for determining path-centric information based on the accepted

6   at least one sample; and

7   c) means for adjusting a traffic metric of a traffic parameter based on the

8   determined path-centric information.

1   26. The apparatus of claim 25 wherein the means for determining path-centric

2   information based on the accepted at least one sample include a searching

3   facility, the search facility (i) using at least a part of the at least one sample as a

4   search key to find a first item with a closest matching key in a first data structure,

5   and (ii) using at least a part of the first item found as a search key to find a

6   second item with a matching key in a second data structure.

1   27. The apparatus of claim 26 wherein the second item includes path-centric

2   information.

1   28. The apparatus of claim 26 wherein the second item includes an origin

2   autonomous system and a peer autonomous system.

1   29. The apparatus of claim 26 wherein the second item includes an autonomous

2   system path.

1   30. The apparatus of claim 25 wherein the means for adjusting a traffic metric of

2   a traffic parameter based on the determined path-centric information include

3   i) a search facility, using a part of the determined path-centric

4   information as a key to search items of traffic parameters; and

5   ii) an aggregator, wherein if a traffic parameter with a matching key

6   is found, the aggregator increments the traffic metric of the traffic

7   parameter, and wherein if none of the traffic parameters has a

8   matching key, the aggregator creates a new item.

1   31. The apparatus of claim 25 wherein the traffic parameter is selected from a

2   group of traffic parameters consisting of (A) a particular pair of source and

3   destination addresses, (B) a particular pair of source and destination ports, and

4   (C) a particular pair of autonomous systems.

1   32. A data forwarding device comprising:

2   a) an addressed data forwarding facility for forwarding addressed data

3   based on forwarding information;

4   b) a routing facility for determining and disseminating network state

5   information, and for generating path information based on the network

6   state information;

7   c) a sampler for generating samples based on accepted addressed data;

8   d) means for determining path-centric information based on the samples

9   generated by the sampler; and

10   e) means for adjusting a traffic metric of a traffic parameter based on the

11   determined path-centric information.

1   33. The data forwarding device of claim 32 wherein the routing facility effects a

2   exterior gateway protocol.

1   34. The data forwarding device of claim 32 wherein the routing facility effects a

2   border gateway protocol.

1   35. A data forwarding device comprising:

2   a) an addressed data forwarding facility for forwarding addressed data

3   based on forwarding information;

4   b) a routing facility for determining and disseminating network state

5   information, and for generating path information based on the network

6   state information;

7   c) means, using the path information generated by the routing facility, for

8   building a first data structure including items of a first type, each of the

9   items of the first type including an autonomous system index and an

10   internet protocol prefix, wherein the internet protocol prefix is a key; and

11   d) means, using the path information generated by the routing facility, for

12   building a second data structure including items of a second type, each of

13   the items of the second type including an autonomous system index and

14   an autonomous system path, wherein the autonomous system index is a

15   key.

1   36. The data forwarding device of claim 35 further comprising:

2   e) a sampler for generating samples based on accepted addressed data;

3   f) means for determining path-centric information based on (i) the

4   samples generated by the sampler, (ii) the first data structure, and (iii) the

5   second data structure; and

6   g) means for adjusting a traffic metric of a traffic parameter based on the

7   determined path-centric information.

1   37. A machine-readable medium having stored thereon:

2   a) a first data structure including items of a first type, each of the items of

3   the first type including an autonomous system index and an internet

4   protocol prefix, wherein the internet protocol prefix is a key; and

5   b) a second data structure including items of a second type, each of the

6   items of the second type including an autonomous system index and an

7   autonomous system path, wherein the autonomous system index is a key.

1   38. The machine-readable medium of claim 37 wherein the first and second data

2   structures are tries.

1   39. The machine-readable medium of claim 37 wherein the first data structure is

2   a Radix trie.

1   40. The machine-readable medium of claim 37 further comprising:

2   c) network information derived from routing information.